

Total number of printed pages-8

3 (Sem-5/CBCS) CHE HC 1

2022

CHEMISTRY

(Honours)

Paper : CHE-HC- 5016

(Organic Chemistry-IV)

Full Marks : 60

Time : Three hours

**The figures in the margin indicate
full marks for the questions.**

1. Answer the following questions :

(any seven)

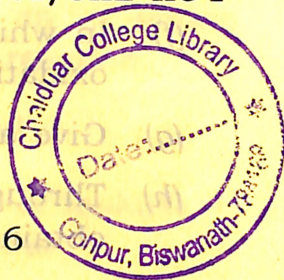
1×7=7

(a) What is the most stabilizing force for nucleic acids ?

(b) Which property is commonly shared by GDP and AMP ?

(c) Name *one* Ketogenic amino acid.

(d) Which enzyme helps in the formation of phosphodiester bond ?



Contd.

(e) Statin drug is an example of _____ inhibition.
(Fill in the blank)

(f) In which site of the cell-beta oxidation takes place ?

(g) Give an example of complex lipid.

(h) Through which process energy is obtained by red blood cells ?

(i) How many chiral centres are present in Ibuprofen molecule ?

(j) What are stop codons ?

(k) Name one enzyme which is secreted by the pancreas.

(l) Name what class of drug is ranitidine ?

2. Answer the following : **(any four)** $2 \times 4 = 8$

(a) Draw the base present in deoxyadenosine monophosphate and deoxyguanosine monophosphate.

(b) Write the significance of base-pairing in DNA.

(c) Give one example of biologically important peptide and write *at least* two functions.

(d) What happens when an α -amino acid is heated ? Write reaction.

(e) How are lipids classified ?

(f) What is the root cause of malaria ? Write the structure of one antimalarial drug.

(g) Draw the structure of NAD^+ and NADH.

(h) Write one function each of NAD^+ and FAD.

3. Answer **any three** of the following :

$$5 \times 3 = 15$$

(a) Describe the double helical structure of DNA. Anticodon is present in which type of RNA ? $4 + 1 = 5$

(b) (i) Give the structure of Lysine. Find the isoelectric point of Lysine of which pK_{a1} is 2.18 pK_{a2} is 8.95 and pK_{a3} is 10.53.

(ii) How many tripeptide bonds are formed by various combination of Gly, Ala and Phe ? Explain. $3 + 2 = 5$

- (c) Write briefly about classification of enzymes. How active sites are subdivided? 4+1=5
- (d) Hydrolysis of ATP results in release of energy. Explain.
- (e) What is respiratory quotient of foodstuff? What does it signify? 3+2=5
- (f) What are narcotics and non-narcotics drugs? Give example of each type. Write chemical name of Analgin and its uses. 3+2=5
- (g) What are tetracyclines? How it is different from streptomycin? Give an example of tetracycline. 2+2+1=5
- (h) (i) What happens when an α -amino acid is allowed to react with formaldehyde? What is the significance of this reaction? 3
- (ii) What is chrome protein? Give an example. 2

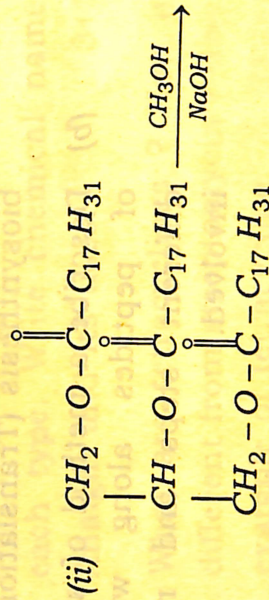
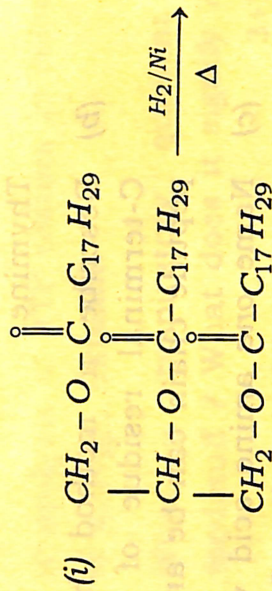
4. Answer **any three** : 10×3=30

- (i) (a) Write *one* method of each synthesis of Adenine and Thymine.
- (b) Describe a method how the C-terminal residue of a polypeptide chain can be analyzed.
- (c) Name *one* amino acid which is not found in α -helix. 5+4+1=10
- (ii) (a) Explain the process of protein biosynthesis (Translation). 5
- (b) Describe a method of synthesis of peptides along with the different steps and reactions involved. 5
- (iii) (a) Explain competitive and non-competitive inhibition of enzyme with examples.
- (b) Name *one* metalloenzyme with its specificity.
- (c) What is special about allosteric inhibition? 6+2+2=10



Contd.

(iv) (a) Find the products of the following reactions of fats/oils :
 $1\frac{1}{2} \times 2 = 3$



(b) Explain acid value and iodine value of oils or fats. Why these two parameters are important ?
 $2 \times 2 = 4$

(c) What are isozymes ? Explain with example.
 3

(v) (a) Write the major steps involved in glycolysis indicating the enzymes that regulate the process.

(b) What is citric acid cycle ? Draw the cycle with different intermediate formed. How many ATPs are produced during one cycle ?
 $5 + (4 + 1) = 10$

(vi) (a) Write different steps involved in the synthesis of chloroquine.

(b) How chloramphenicol can be prepared from a suitable substrate ?

(c) What is ranitidine ? What are the side effects of using antacid for long ?
 $4 + 4 + 2 = 10$

(vii) (a) Show diagrammatically A-T and G-C base pairing.

(b) Write the structure of the bases found in RNA.

Write the structure of dAMP.

(c) Describe the solid-phase synthesis of peptides.

$3 + 2 + 1 + 4 = 10$

Contd.

(viii) (a) Write a method of synthesis of paracetamol.

(b) Mention *four* qualities that an antibiotic must possess.

(c) Point out the essential difference between oils and fats.

(d) Mention *one* medicinal value of turmeric and neem.

(e) What do you mean by rancidity ?
How can rancidity be minimised in foods ? $2+2+2+2+2=10$

